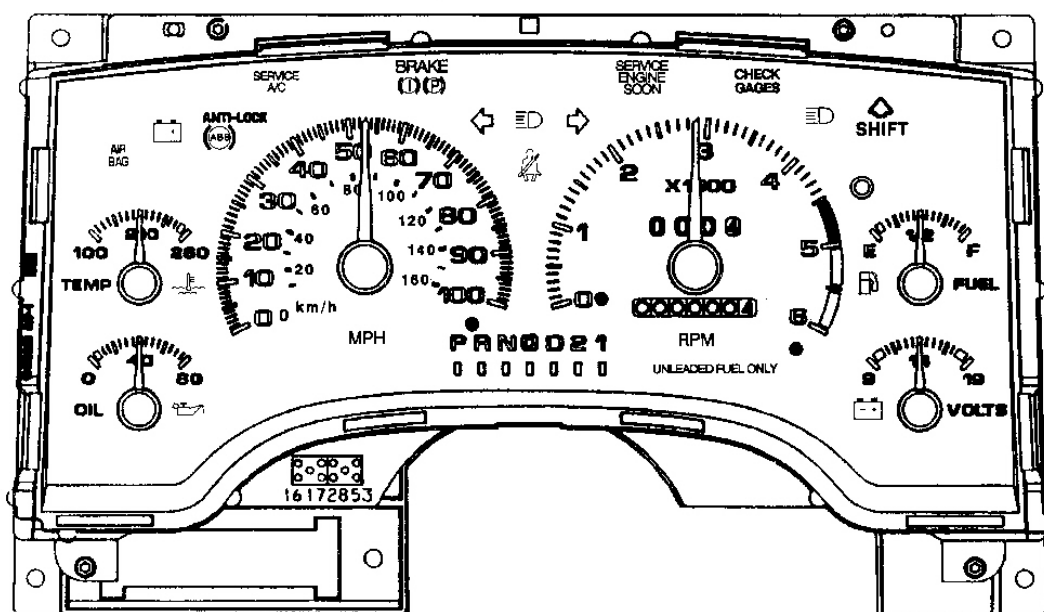


1997 ACCESSORIES/SAFETY EQUIP

Analog Instrument Panels - General Motors Corp.

DESCRIPTION

Instrument cluster uses analog speedometer and gauges. See **Fig. 1**. Indicator lights, plugged into back of cluster, are serviceable, but no other components on cluster are serviceable. If any component on cluster is faulty, replace cluster.



97C28441

Fig. 1: Identifying Instrument Components
Courtesy of GENERAL MOTORS CORP.

WARNING: If BRAKE light is on, ensure brake hydraulic system is okay before driving vehicle.

BRAKE

When one or more of the following conditions exists, BRAKE light is grounded, turning on light:

- Parking brake switch is closed.
- Brake pressure differential switch is closed (detects loss of hydraulic pressure).

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- BPMV detects problem in hydraulic part of ABS system. Light also comes on for 2 seconds after ignition is turned on, and engine is off (BPMV turns on light for 2-second system check).

CHARGING SYSTEM

One side of battery symbol light bulb is connected to alternator field circuit, and other side to ignition power circuit. When ignition is turned on, bulb is grounded through field circuit. When engine is started, field output equalizes voltage across bulb, turning off light. If charging system output is insufficient, light comes on.

CHECK GAUGES

If coolant temperature is too high or oil pressure is too low, light comes on to alert driver of condition indicated by gauges. A CHECK GAUGES light driver (part of coolant temperature gauge) monitors signals from temperature gauge sending unit and oil pressure sending unit. If CHECK GAUGES light driver receives a signal from either sending unit, it grounds light.

COOLANT TEMPERATURE

See CHECK GAUGES .

OIL PRESSURE

See CHECK GAUGES .

SEAT BELT LIGHT

Seat belt warning light works in conjunction with a buzzer. If seat belt is not fastened when key is turned to run, buzzer will sound for 8 seconds and light will illuminate solid for 20 seconds and flash for 55 seconds. Buzzer will stop if belt is fastened during 8 second interval. If seat belt is fastened when key is turned to run, no buzzer will sound and light will illuminate solid for 75 seconds. If seat belt is unfastened during 8 second interval, buzzer will sound for remainder of 8 second interval.

SERVICE ENGINE SOON

If a problem occurs in engine control system, PCM/VCM grounds light. Light should come on when ignition is turned on, then go out when engine starts if no problems exist in engine control system.

SHIFT (M/T)

Light comes on to tell driver when to upshift for best fuel economy. PCM/VCM monitors engine speed, load and throttle position for light control. PCM/VCM grounds light if parameters are met.

AIR BAG PRECAUTIONS

Observe following precautions when working with vehicles equipped with Supplemental Inflatable Restraint (SIR) system:

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- Before performing any instrument panel testing, diagnosis or repair, disable SIR system by disconnecting negative battery cable and Yellow 2-pin connector at base of steering column.
- Wait 2 minutes before making SIR repairs. SIR system retains enough voltage to deploy air bag after power is disconnected.
- To prevent accidental air bag deployment, avoid SIR wiring harness when trouble shooting instrument panel components. All SIR wires are color-coded Yellow.

SPEEDOMETER & ODOMETER

Vehicle Speed Sensor (VSS) produces voltage pulses of frequency proportional to vehicle speed. This signal is processed by PCM/VCM to produce a voltage pulse signal to speedometer and odometer.

NOTE: **Incorrect VSS calibrator calibration may adversely affect operation of ABS, engine control system and cruise control system.**

TRIPMETER

Pressing button on cluster resets trip mileage to zero.

TESTING

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

CAUTION: Static electricity can destroy integrated circuits in instrument cluster and VSS calibrator. Before servicing these components, ground yourself and work area to discharge static electricity.

NOTE: **Check GAUGES or IGN/GAU fuse in passenger compartment fuse block before testing. If all components in cluster are inoperative, check instrument cluster power and ground circuits. If power and ground circuits are okay, replace instrument cluster.**

COOLANT TEMPERATURE GAUGE

Gauge Indicates Cold When Engine Is Hot

Disconnect temperature gauge sending unit connector. Connect jumper between ground and Dark Green wire terminal of sending unit connector. Turn ignition on. If gauge indicates hot, replace sending unit. If gauge does not indicate hot, check Dark Green wire between sending unit and cluster. If wire is okay, replace instrument cluster.

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Gauge Indicates Hot When Engine Is Cold

Disconnect temperature gauge sending unit connector. Turn ignition on. If gauge indicates cold, replace sending unit. If gauge still indicates hot, check Dark Green wire between sending unit and cluster. If wire is okay, replace instrument cluster.

FUEL GAUGE

Gauge Stays At EMPTY

Disconnect fuel tank sending unit connector. Turn ignition on. If gauge indicates FULL, replace sending unit. If gauge indicates EMPTY, check for short to ground in Purple wire. If wire is okay, replace instrument cluster.

Gauge Stays At FULL

Disconnect fuel tank sending unit connector. Turn ignition on. Connect fused jumper wire between ground and Purple wire terminal of sending unit connector. If gauge indicates EMPTY, replace sending unit. If gauge indicates FULL, check Purple wire between sending unit and instrument cluster for an open circuit. If wire is okay, replace instrument cluster.

Gauge Is Inaccurate

1. Disconnect fuel tank sending unit connector. Connect Red lead of Instrument Panel Tester (J-33431) to sending unit harness connector terminal (Purple wire), and connect other Red lead to ground. Turn ignition on.
2. Set tester dial to zero ohms, then 90 ohms. If fuel gauge indicates EMPTY at zero ohms and FULL at 90 ohms, check sending unit ground. If ground is okay, replace sending unit. If fuel gauge does not indicate as specified, check Purple wire between sending unit and cluster. If wire is okay, fuel gauge.

INDICATOR LIGHTS

Brake Warning Light Inoperative

Disconnect instrument cluster connector. Set parking brake. Connect self-powered test light between instrument cluster connector Tan/White wire and ground. If test light comes on, check for poor connection at instrument cluster connector. If connection is okay, replace instrument cluster. If test light does not light, repair open circuit in Tan/White wire.

Ignition Switch Does Not Activate Brake Warning Light

1. Turn ignition on. Set parking brake. If brake warning light comes on, go to next step. If brake warning light does not come on, go to BRAKE WARNING LIGHT INOPERATIVE.
2. Release parking brake. Connect fused jumper wire between ground and Light Blue wire at 48-pin connector between ignition switch and parking brake warning switch. Turn ignition on. If brake warning light comes on, go to next step. If brake warning light does not come on, repair open circuit in Light Blue wire.
3. Connect fused jumper wire between Light Blue and Black wires at 48-pin connector. Turn ignition on. If

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brake warning light comes on, replace ignition switch. If brake warning light does not come on, repair open circuit in Black wire between 48-pin connector and ground.

Parking Brake Will Not Activate Brake Warning Light

1. Disconnect parking brake warning switch connector. Connect fused jumper wire between Light Blue wire at parking brake warning switch connector and ground. Turn ignition on. If brake warning light does not come on, go to next step. If brake warning light does come on, check for poor connection at parking brake warning switch. If connection is okay, replace parking brake warning switch.
2. Remove fused jumper wire. Connect fused jumper wire between instrument cluster connector Tan/White wire and ground. If brake warning light comes on, go to next step. If brake warning light does not come on, check for poor connection at instrument cluster connector. If connection is okay, replace instrument cluster.
3. Connect test light between diode module Light Blue wire and ground. If test light comes on, repair open circuit in Light Blue wire. If test light does not come on, repair open circuit in Tan/White wire between instrument cluster and diode module. If circuit is okay, replace diode module.

Brake Warning Light Remains On With Ignition On & Parking Brake Released

1. Disconnect parking brake warning switch connector. If brake warning light remains on, go to next step. If brake warning light does not remain on, replace parking brake warning switch.
2. Disconnect brake pressure warning switch connector (Brake Pressure Modulator Valve (BPMV) front connector). BPMV is located in engine compartment, on left inner fender panel and connector is on front side of BPMV. If brake pressure warning light remains on, go to next step. If brake pressure warning light does not remain on, replace brake pressure warning switch.
3. Disconnect 48-pin connector between ignition switch and parking brake warning switch. Check continuity between terminals B5 (Tan/White wire) and B2 (Black wire). If no continuity is present, reconnect connector and go to next step. If continuity is present, replace ignition switch.
4. Disconnect brake pressure modulator valve 10-pin connector. If brake warning light remains on, check Purple or Tan/White wires for a short to ground. If wires are okay, replace instrument cluster. If brake warning light does not remain on, diagnose brake system. See **ANTI-LOCK BRAKE SYSTEM** article in BRAKES section.

CHECK GAUGES Or Temperature Indicator Does Not Light With Ignition Switch In Run Or Start

Disconnect ignition switch connector. Connect fused jumper wire between Dark Green wire at ignition switch connector and ground. Turn ignition on. If temperature or CHECK GAUGES indicator lights, replace ignition switch. If temperature or CHECK GAUGES indicator does not light, repair open circuit in Dark Green wire between ignition switch connector and instrument cluster connector.

CHECK GAUGES Light Inoperative With High Coolant Temperature

Inspect CHECK GAUGES bulb and replace if faulty. If bulb is okay, replace instrument cluster.

CHECK GAUGES Light Inoperative With Low Oil Pressure

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Inspect CHECK GAUGES bulb and replace if faulty. If bulb is okay, replace instrument cluster.

OIL PRESSURE GAUGE

NOTE: If procedure specifies replacing oil pressure sending unit, replace with revised sending unit. Some older version sending units may cause gauge to indicate oil pressure higher than actual pressure, or may cause gauge fluctuations. Check with manufacturer for latest part number.

Gauge Is Inaccurate

1. Disconnect oil pressure sending unit connector. Connect one Red wire lead of Instrument Panel Tester (J-33431) to Tan wire terminal of temperature sending unit connector, and connect other Red lead to ground. Turn ignition on.
2. Adjust tester dial to zero ohms, then 90 ohms. If gauge indicates LOW at zero ohms and HIGH at 90 ohms, replace sending unit. If gauge does not indicate as specified, check for open in Tan wire between sending unit and instrument cluster. If wire is okay, replace instrument cluster.

SPEEDOMETER & ODOMETER

NOTE: Speedometer and odometer testing for is not available from manufacturer.

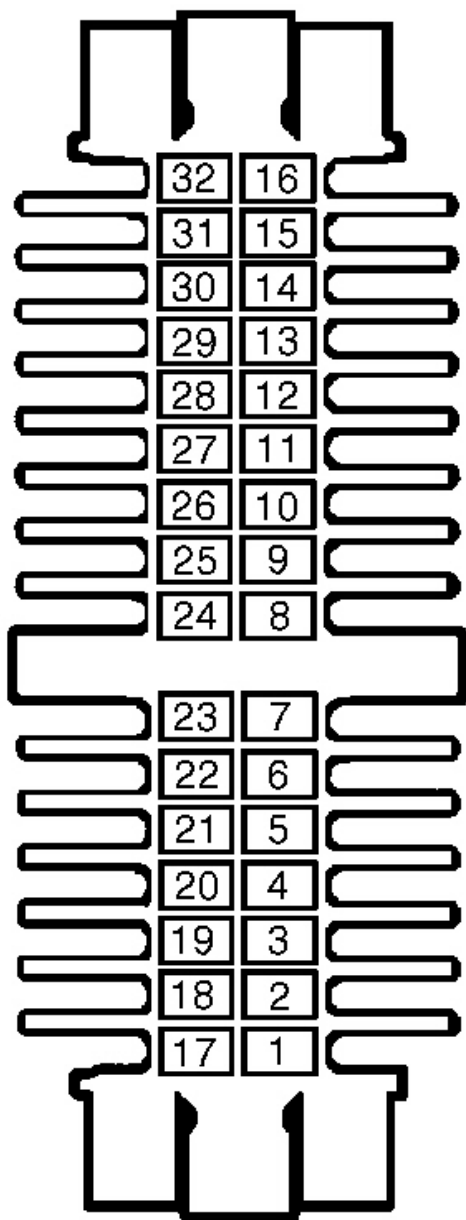
TACHOMETER

Tachometer Inoperative

Connect Tech 1 scan tool to data link connector. Start engine. Read engine RPM from Tech 1 scan tool. If Tech 1 scan tool displays engine RPM, repair open or short to ground in White wire between ignition coil and instrument cluster terminal No. 8. See **Fig. 2** . If wire is okay, replace instrument cluster. If Tech 1 displays zero for engine RPM, repair open or short to ground in White wire. If wire is okay, replace ignition coil or Powertrain Control Module (PCM).

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Fig. 2: Instrument Cluster Connector
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VOLTMETER

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Voltmeter Inaccurate

Turn ignition on. Check voltage across battery terminals. If battery voltage matches vehicle voltmeter, voltmeter is accurate. If battery voltage does not match vehicle voltmeter, check for open or high resistance in Pink or Black wires at instrument cluster. If wires are okay, replace instrument cluster.

REMOVAL & INSTALLATION

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION** before disconnecting battery.

CAUTION: Static electricity can destroy integrated circuits in instrument cluster and VSS calibrator. Before servicing these components, ground yourself and work area to discharge static electricity.

INSTRUMENT CLUSTER

Removal & Installation

Disconnect negative battery cable. Disable SIR system. See **AIR BAG PRECAUTIONS** . Remove sound insulation. Remove steering column cover nuts. Remove steering column cover. Remove instrument cluster bezel. Remove 4 cluster-to-instrument panel screws. Disconnect electrical connector. Remove cluster. See [Fig. 3](#) . To install, reverse removal procedure.

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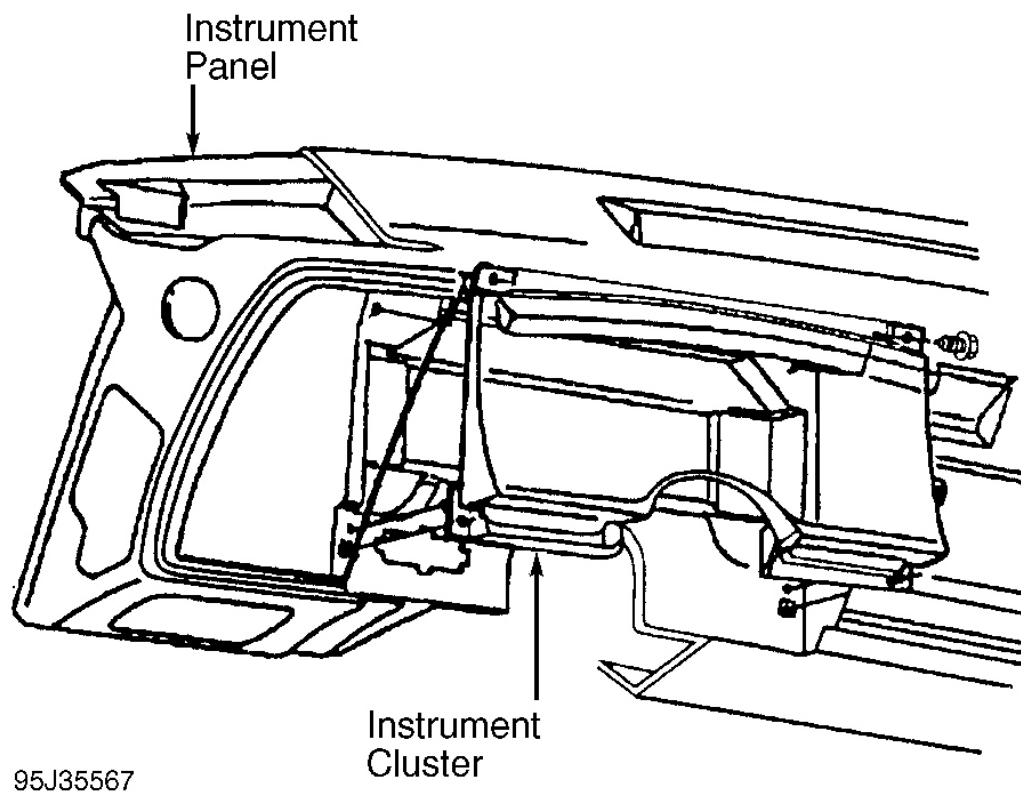


Fig. 3: Exploded View Of Instrument Cluster
Courtesy of GENERAL MOTORS CORP.

WIRING DIAGRAMS

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Fig. 4: Analog Instrument Panel Wiring Diagram (1 Of 2)

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Fig. 5: Analog Instrument Panel Wiring Diagram (2 Of 2)